

AN ACCOUNT  
OF THE  
**CRUSTACEA**  
OF  
NORWAY

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY  
G. O. SARS

VOL. VII  
COPEPODA  
SUPPLEMENT

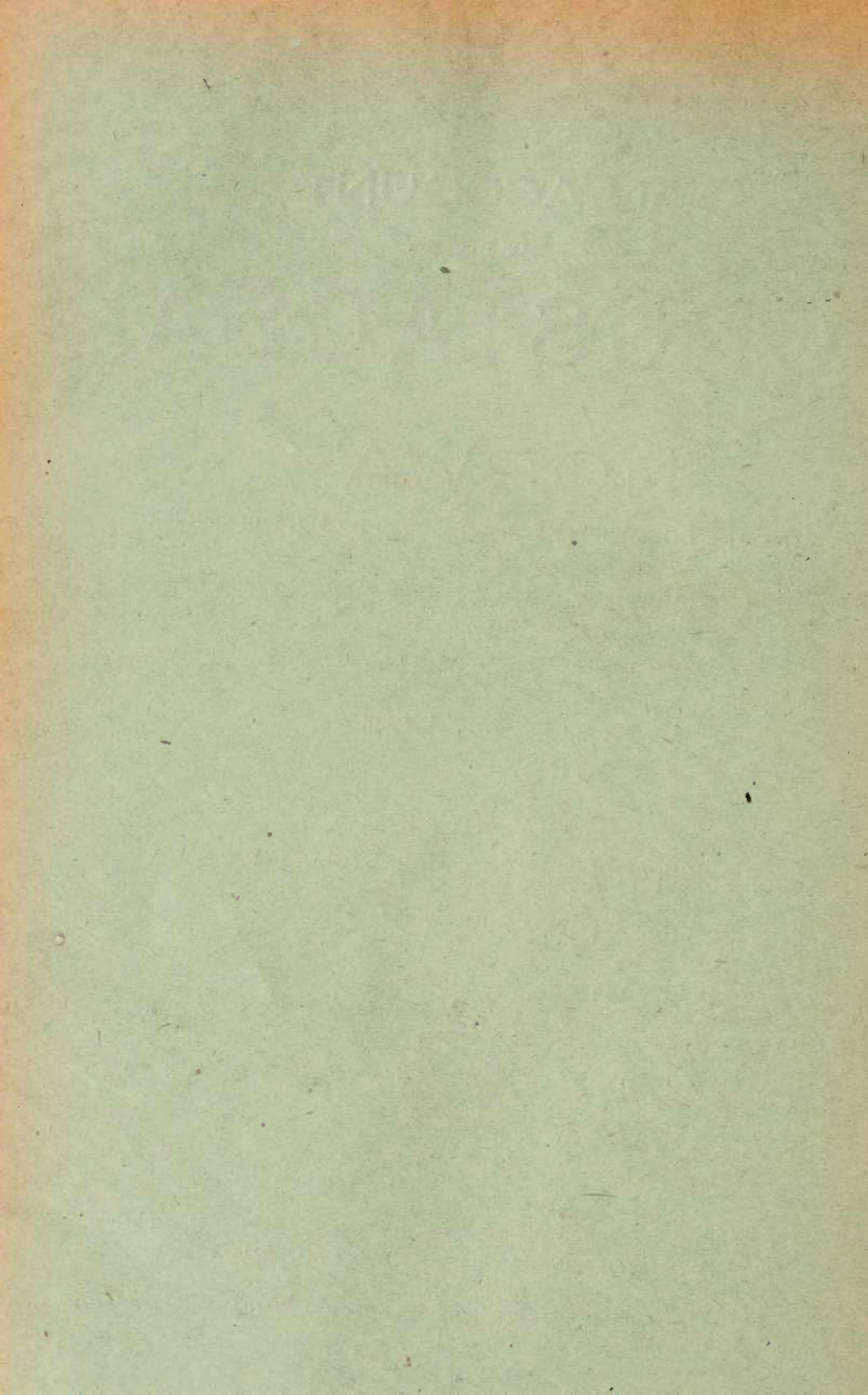
PARTS IX & X  
HARPACTICOIDA (concluded), CYCLOPOIDA

WITH 12 AUTOTYPIC PLATES



**BERGEN**  
PUBLISHED BY THE BERGEN MUSEUM

SOLD BY  
ALB. CAMMERMEYERS'S FORLAG, CHRISTIANIA  
1921









AN ACCOUNT  
OF THE  
CRUSTACEA  
OF  
NORWAY

1870

CHRISTMAS

1870

AN ACCOUNT  
OF THE  
**CRUSTACEA**  
OF  
**NORWAY**

WITH SHORT DESCRIPTIONS AND FIGURES OF ALL THE SPECIES

BY

G. O. SARS

PROFESSOR OF ZOOLOGY AT THE UNIVERSITY OF CHRISTIANIA

VOL. VII

**COPEPODA**

SUPPLEMENT

WITH 76 AUTOTYPIC PLATES



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## PREFACE.

By the present Volume my Account of the 3 leading divisions of Copepoda, the *Calanoida*, *Harpacticoida* and *Cyclopoida* is finally concluded. Yet there still remains a considerable bulk of Copepoda of a more or less pronouncedly parasitic nature, the most familiar of which are the genuine Fish-parasites, the *Caligoida* and the *Lernæoida*. These 2 divisions have however recently been so carefully treated of in the excellent and beautifully illustrated work of Th. & A. Scott (British parasitic Copepoda), that a renewed account of these forms appears to be less needed. On the other hand, 2 other anomalous divisions of Copepoda, likewise in some measure parasitic in habits, but not included in the above mentioned work, viz., the *Monstrilloida* and the *Notodelphyoida*, may be more worthy of a careful reexamination. It is indeed my purpose in the next Volume now in preparation to give an exhaustive account of the Norwegian forms referable to these 2 interesting divisions, which in some respects show relations partly to the free-living Copepoda, partly to the true parasites.

I take the occasion again to express my most sincere thanks to the Direction of the Bergen Museum for the interest it has shown for my work and for the kindness in giving me an opportunity of still continuing it, in spite of the many obstacles which in these difficult times have arisen against the printing and publication.

G. O. Sars.



75. *Danielssenia robusta*, G. O. Sars, n. sp.

(Pl. LXIV).

*Specific Characters.*—*Female.* Body comparatively robust, with the anterior division rather dilated and evenly vaulted above. Cephalic segment nearly as long as the 3 succeeding segments combined, and produced in front to a thin rostral plate obtusely rounded and somewhat deflexed at the end. Epimeral plates of the 3 succeeding segments somewhat produced behind. Last trunkal segment very small. Urosome comparatively short, scarcely attaining half the length of the anterior division, and only very slightly tapered behind, its segments minutely denticulate at the hind edges; genital segment about the length of the 2 succeeding segments combined; last segment somewhat smaller than the preceding one. Caudal rami very short, being scarcely half as long as they are broad; apical setæ rather slender. Anterior antennæ, as in the type species, only composed of 4 joints, and exhibiting a very similar structure and armature. Posterior antennæ likewise very similar. Mandibular palp with the basal part considerably expanded, and carrying along the hind edge of the projecting inner part 4 strong ciliated setæ. Maxillæ and maxillipeds scarcely differing in their structure from those parts in the other species. Natatory legs likewise built on the same type, though differing in the inner ramus being somewhat more produced. Last pair of legs comparatively of smaller size than in the other 2 Norwegian species, with the distal joint less broad and having the innermost seta spiniform; inner expansion of proximal joint far less produced, scarcely extending beyond the distal joint, and only provided with 3 marginal setæ.

Colour whitish grey, with a faint rosy tinge.

Length of adult female about 1 mm.

*Remarks.*—The present form is nearly allied to the other 2 Norwegian species, through more robust in shape, and also of larger size than any of them. The structure of the several appendages agrees on the whole rather closely with that found in the said species, except the last pair of legs, which are of much smaller size and also conspicuously different in shape.

*Occurrence.*—Several specimens of this large species, most of them of the female sex, were found at Risør in depths ranging from 30 to 60 fathoms, coarse muddy sand.



Gen. *Psammis*, G. O. Sars.

*Remarks.*—This genus was established by the present author in the year 1911, to include a single species of which at that time only 2 female specimens had come under my notice. I have subsequently had an opportunity of examining also a fully adult male specimen, and, as the sexual differences in this form are rather striking, both as regards the outward appearance and the structure of some of the appendages, I have found it advisable to give below a full description of the specimen accompanied by figures of the whole animal and of some of the structural details.

76. *Psammis longisetosa*, G. O. Sars.

(Pl. LXV).

See Vol. V, p. 339, Pl. CCXXV.

*Specific Characters.*—*Male.* Body considerably more slender than in female and gradually tapered behind. Cephalic segment about occupying half the length of the anterior division, and provided in front with a well-defined and rather prominent rostral plate of regularly oval form, with 2 delicate sensory hairs on each side. Urosome about equalling in length  $\frac{3}{4}$  of the anterior division, and composed of 5 well defined segments, the 4 anterior of which are of about equal size; last segment considerably smaller and somewhat widening distally, with the anal opercle inconspicuous. Caudal rami considerably divergent, with the apical setæ greatly prolonged. Anterior antennæ very strongly built and conspicuously hinged, being apparently composed of 7 joints, the penultimate of which is strongly inflated, almost globose in form; terminal joint narrow unguiform and very mobile, admitting of being impinged against the anterior face of the preceding joint, both together forming a very powerful grasping organ. Posterior antennæ and oral parts scarcely different from those in female. 1st pair of legs also rather similar, only differing in the shape of the spine issuing from the inner corner of the 2nd basal joint, this spine being not, as in the female, straight, but distinctly curved inwards. 2nd pair of legs with the inner ramus conspicuously transformed, each of the joints being produced at the end outside to a well defined acuminate process, that of the middle joint being much the largest, mucroniform, and extending almost to the end of the terminal joint. The 2 succeeding pairs of legs of the very same structure as in the female. Last pair of legs however very different, the distal joint being not, as in the female confluent with the proximal one, but

well defined, rounded in form and carrying 4 slender marginal spines; inner expansion of proximal joint comparatively small, scarcely extending beyond the middle of the distal joint, and only provided with 2 spines of somewhat unequal length.

Length of the specimen examined 0.72 mm.

*Remarks.*—The identification of the above-described form as the male of *P. longisetosa* cannot be contested, though some of the characters, especially the structure of the last pair of legs, are not in accordance with the diagnosis previously given of the genus.

*Occurrence.*—The above-described male specimen was, like the female, found at Farsund. I have not met with this form in any other locality on the Norwegian coast.

### Gen. *Argestes*, G. O. Sars.

*Remarks.*—This is another genus originally founded only on a single species, *A. mollis* G. O. Sars, found at Bukken, south west coast of Norway. A slender Copepod recently found off the southern coast seems, according to the structural details, to be referable to the same genus, though in its outward appearance it looks rather different from the type species. A description of this form is given below.

#### 77. *Argestes tenuis*, G. O. Sars, n. sp.

(Pl. LXVII).

*Specific Characters.*—*Female.* Body slender and narrow, with the anterior division only slightly dilated, and the integuments very thin and pellucid. Cephalic segment somewhat exceeding in length the 2 succeeding segments combined, and without any distinctly defined rostral projection. Lateral parts of the 3 succeeding segments rounded off; last trunkal segment smaller than the preceding one. Urosome narrow cylindrical in form, and nearly attaining the length of the anterior division, its segments very finely denticulate at the hind edges, and clothed laterally with delicate adpressed spikes; genital segment comparatively large and conspicuously protuberant below in its anterior part; last segment somewhat larger than the preceding segment and quadrangular in outline, anal opercle very broad and perfectly smooth at the edge. Caudal rami about the length of the anal segment and narrow linear in form, with all the setæ issuing from the slightly thickened extremity, the 2 middle apical setæ very slender. Anterior antennæ nearly as long as

the cephalic segment and, as in the type species, composed of 7 well defined joints clothed with rather strong finely denticulated setæ; the first 2 joints much larger than the others, terminal part, composed of the 3 outermost joints, about half the length of the proximal one, with the last joint the largest. Posterior antennæ comparatively feeble in structure, with the outer ramus rudimentary. Mandibular palp without any distinctly defined outer ramus, its place being occupied by a simple seta. Maxillæ and maxillipeds scarcely different from those in the type species. Natatory legs, as in that species, well developed, with both rami distinctly 3-articulate, being in 1st pair of about equal size, in the succeeding pairs a little unequal, though less so than in the type species. Last pair of legs with the distal joint considerably produced and of narrow linear form, carrying 5 comparatively small marginal setæ, the proximal one of the outer edge rather remote from the others; proximal joint quite short, and not at all expanded inside, with only 2 small juxtaposed bristles on the hind margin.

*Male* somewhat smaller than female, and resembling it in the general shape of the body, being however easily recognised by the more strongly built and distinctly hinged anterior antennæ.

Colour whitish pellucid.

Length of adult female 0.83 mm.

*Remarks.*—In its outward appearance this Copepod bears a general resemblance to the form described above as *Leptocletodes debilis*, exhibiting a rather similar slender and narrow shape of the body and a similar week consistency of the integuments. On a closer examination, however, the structure of the several appendages, and more particularly that of the natatory legs, is found to be essentially different, and on the whole perfectly agreeing with that in *Argestes mollis*, with which species it accordingly must be associated in the same genus.

*Occurrence.*—I have only met with this form in a single locality on the Norwegian coast, viz., at Risør, where some few specimens were taken from the considerable depth of 60—80 fathoms, muddy bottom.

### Gen. *Euterpina*, Norman, 1903.

Syn: *Euterpe*, Claus (not Swainson).

*Generic Characters.*—Body subpyriform in shape, with no very sharply marked limit between the anterior and posterior divisions. Cephalic segment large and acutely produced in front. Urosome comparatively small, with the

caudal rami not much produced, setæ of the latter reduced in number. Anterior antennæ in female of moderate size, and clothed with scattered simple setæ; those in male much larger and very strongly hinged. Posterior antennæ with the outer ramus well defined, though only composed of a single joint. Mandibles rather coarse, with the palp distinctly biramous. Maxillæ without any distinctly defined exopodal and epipodal lobes. Anterior maxillipeds with 3 well defined setiferous lobes inside the basal part. Posterior maxillipeds extremely slender and narrow. 1st pair of legs with both rami short, biarticulate; the 3 succeeding pairs with the rami distinctly 3-articulate, but of rather unequal size. Last pair of legs represented by two undivided juxtaposed plates, which in male are coalesced in the middle.

*Remarks.*—As the name *Euterge*, originally assigned to this genus by Claus, had been preoccupied in Entomology, the above slight change of the name has been proposed by the Canon Norman. The genus is somewhat allied to *Tachidius*, differing however in some particulars rather markedly, especially as regards the structure of the posterior maxillipeds and the 1st pair of legs. It comprises as yet only a single species, to be described below.

#### 78. *Euterpina acutifrons*, (Dana).

(Pl. LXVIII).

*Harpacticus? acutifrons*, Dana, Crustacea of the Un. St. Expedition, p. 1192, Pl. 83, figs. 11 a—b.

Syn: *Euterge gracilis*, Claus.

*Specific Characters.*—*Female.* Body comparatively slender, with the anterior division conspicuously broader than the posterior and evenly vaulted above. Cephalic segment occupying about half the length of the anterior division, and gradually exerted in front to a greatly prominent rostral prominence, acute at the tip. Lateral parts of the succeeding segments not expanded. Last trunkal segment much smaller than the preceding one. Urosome not nearly attaining half the length of the anterior division and rather narrow, tapered distally, with the segments minutely denticulated at the hind edges; genital segment about the length of the 2 succeeding segments combined and imperfectly subdivided beyond the middle; last segment scarcely shorter than the preceding one, with the anal opercle finely denticulated at the edge. Caudal rami only slightly longer than they are broad and not at all divergent, each ramus provided near the base with a small subdorsal bristle and at the transversely truncated extremity with 2 rather strong setæ of unequal length. Anterior antennæ about half as long as the cephalic segment and rather narrow,

being composed of 7 well defined joints not much different in size, the terminal one however rather smaller than the others. Posterior antennæ with the basal part distinctly subdivided, terminal joint with the spines and setæ rather slender; outer ramus provided with 4 subequal ciliated setæ. Posterior maxilliped with the hand scarcely at all dilated and about of same size and appearance as the basal joint, dactylus extremely slender, with scattered long hairs inside. 1st pair of legs rather small, and provided with the usual deflexed spine at the inner corner of the 2nd basal joint; rami of about equal size, with the distal joint somewhat larger than the proximal one. The 3 succeeding pairs of legs with the outer ramus rather strongly built and densely fringed outside with small spinules, spines attached to this ramus unusually coarse, 3 of them issuing close together from the end of the terminal joint; inner ramus shorter and much narrower than the outer. Last pair of legs consisting of 2 juxtaposed oblong quadrangular plates, contiguous at the base and fringed inside and at the end with short cilia, each plate having outside, at some distance from the base, a slender bristle and moreover 5 comparatively short and finely denticulated spines, one of them attached to the outer edge in about the middle, the other 4 to the transversely truncated end. Ovisac of moderate size and globular in form.

*Male* of about same size as female, and not very different in the shape of the body. Anterior antennæ however much more strongly built and pronouncedly fringed, being apparently only composed of 5 joints, the penultimate of which is very large and tumid, sub-pyriform in shape; terminal joint forming a slender and very mobile claw-like dactylus. Posterior antennæ with one of the setæ attached to the outer ramus much stronger than the others, almost claw-shaped. 1st pair of legs differing somewhat from those in the female in the shape of the inner ramus, the proximal joint of which is comparatively more produced and forming with the distal one an abrupt geniculate bend. Last pair of legs rather unlike those in female, being represented by a single median plate, divided at the end by a short incision into 2 small lobules, each carrying 2 short spines. Genital lobes rather prominent, each armed with 2 coarse spines.

Body in both sexes pellucid, without any conspicuous pigmentation. Eye in preserved specimens inconspicuous, but well observable in the living animal, and of a light red colour.

Length of adult female reaching 0.67 mm.

*Remarks.*— This form has by most authors been recorded under the name *Euterte gracilis* given to it by Claus; but there cannot be any doubt



that Giesbrecht was right in identifying it with the species previously recorded by Dana as *Harpacticus acutifrons*. It is an easily recognisable form, differing also markedly in habits from most other *Harpacticoida*, being a true pelagic animal.

*Occurrence*.—Some specimens of this widely distributed Copepod were found in a plankton-sample taken in the Skaggerak, about midway between the Norwegian coast and Skagen, and this occurrence may justify the reception of the present form within the Fauna of Norway.

*Distribution*.—North Sea (at Helgoland), Atlantic Ocean, Mediterranean, Indian Ocean.

## Fam. Clytemnestridæ.

*Remarks*.—This family has recently been established by A. Scott, to include the genus *Clytemnestra* of Dana, which indeed in several points differs so markedly from the other *Harpacticoida*, that it scarcely can find its place in any of the other families of that division. No other genus referable to this family is as yet known.

### Gen. *Clytemnestra*, Dana, 1852.

Syn: *Goniopelte*, Claus.

• *Goniopsyllus*, Brady.

*Generic Characters*.—Body more or less slender, tapering distally, with the anterior division conspicuously depressed, its segments, except the last one, being lamellarly expanded and projecting laterally to prominent triangular lappets. Cephalic segment very large, clypeiform, and produced in front to a well defined rostral prominence. Urosome much narrower than the anterior division, and sub-cylindrical in form. Caudal rami comparatively short, with the apical setæ much reduced in size. Anterior antennæ slender and attenuated, composed of 7 or 8 joints; those in male imperfectly hinged. Posterior antennæ with the outer ramus replaced by one or 2 setæ. Mandibles very small, with the masticatory part narrowly exerted and the palp obsolete. Maxillæ much reduced. Anterior maxillipeds with only a single setiferous lobe inside the basal part. Posterior maxillipeds very slender, with the basal part

much produced; hand in female scarcely at all dilated, with the dactylus very small, in male somewhat more strongly developed. Natatory legs slender, with the inner ramus in all of them 3-articulate and longer than the outer, the later in 1st pair uniarticulate, in the succeeding pairs 3-articulate. Last pair of legs forming each a narrow biarticulate stem extended somewhat laterally.

*Remarks.*—The present genus was established by Dana in the year 1852, to include a peculiar Copepod found in the Pacific. Neither Claus nor Brady recognised Dana's genus, and the generic names proposed by these authors, *Goniopelte* and *Goniopsyllus*, are indeed only synonyms of that genus. The species of the present genus are readily recognised by the peculiar flattened and lacinate shape of the anterior part of the body, caused by the lamellar expansions of the segments, as also by the very short caudal setæ. Of the structural details may be noted the poor development of the oral parts, and the rather anomalous structure of the legs, especially that of the 1st and last pairs. The genus comprises as yet only 2 nearly-allied species, both truly pelagic in habits. One of these species has proved to be referable to the Fauna of Norway, and will be described below.

#### 79. *Clytemnestra scutellata*, Dana.

(Pl. LXIX).

*Clytemnestra scutellata*, Dana, Crustacea of the U. S. Explor. Expedition, p. 1194, Pl. 83.

Syn: *Goniopelte gracilis*, Claus.

*Specific Characters.*—*Female.* Body moderately slender and rapidly tapered behind, with the anterior division conspicuously expanded and somewhat flattened. Cephalic segment very large and broad, fully occupying half the length of the anterior division, with the postero-lateral corners triangularly produced; rostral projection rather prominent and obtusely pointed at the end. The 3 succeeding segments successively somewhat diminishing in size, each produced laterally to a prominent triangular lappet pointing obliquely backwards. Last trunkal segment very small, without any lateral expansions. Uro-some scarcely attaining half the length of the anterior division and of narrow cylindrical form, though a little tapering in its outermost part; genital segment comparatively large and not subdivided in the middle; last segment about the size of the preceding one and transversely truncated at the end, with the anal opercle very small. Caudal rami fully twice as long as they are broad and somewhat incurved, with the outer distal corner conically produced; outer edge with 2 successive slender spines near the base and a short seta close to the



end; dorsal seta likewise attached near the end; apical setæ 3 in number, the innermost very small, the middle one the longest, though only slightly exceeding the ramus in length. Anterior antennæ very slender and attenuated, exceeding somewhat in length the cephalic segment, and composed of 8 well defined joints clothed with scattered comparatively short setæ, each antenna carrying more-over 5 well developed æsthetascs, one attached in the middle of the 4th joint, 2 to the end of the 5th joint, and 2 to the tip of the very slender terminal joint. Posterior antennæ with the basal part distinctly subdivided, terminal joint comparatively narrow, with the number of spines and setæ reduced; outer ramus replaced by 2 juxtaposed ciliated setæ of equal length. 1st pair of legs wanting the usual spine inside the 2nd basal joint; outer ramus imperfectly developed, only consisting of a single narrow linear joint, not even extending to the middle of the 2nd joint of the inner, and without any spines outside. The 3 succeeding pairs of legs with the 2nd basal joint bent outwards at an angle with the 1st; both rami distinctly triarticulate and very narrow, the inner one being the longer; 1st joint of outer ramus nearly as long as the other 2 combined and in 2nd pair wanting the usual spine outside. Last pair of legs with the distal joint about 3 times as long as the proximal one and very narrow, carrying 6 slender marginal setæ, 2 on the outer edge and 4 on the apex.

Colour (according to Giesbrecht) whitish grey, with a slight rosy tinge. Length of the specimen examined 1.24 mm.

*Remarks.*—This is the species first described, and may accordingly be considered as the type of the present genus. It is closely allied to the form recorded by Brady from the Challenger Expedition under the name of *Goniosyllus rostratus*, which, as stated by Giesbrecht, is another species of the same genus, differing from the one here described in the comparatively shorter caudal rami, as also somewhat in the structure of the antennæ. In Brady's species the anterior ones are only composed of 7 joints, and the posterior one have only a single seta in the place of the outer ramus.

*Occurrence.*—A solitary female specimen of the present form was found in a sample taken, many years ago, in the upper part of the Christiania Fjord. This is the only instance of the occurrence of the present form off the coasts of Norway. I have never met with it subsequently.

*Distribution.*—Irish Sea, Atlantic Ocean, Mediterranean, Gulf of Guinea, Indian and Pacific Oceans.

# CYCLOPOIDA.

## Gnathostoma.

### Fam. Cyclopinidæ.

#### Gen. Cyclopina, Claus.

*Remarks.*—On a careful examination of numerous specimens of *Cyclopina* taken in many different places of our coast, I am led to the conclusion that several nearly-allied species have hitherto been confounded, some of them agreeing more closely with *C. gracilis* Claus, some others with *C. longicornis* Boeck. The supposed variability in the 2 said species of the caudal rami I am now not prepared to admit. In all other known Copepoda these appendages exhibit a perfectly constant appearance both as to form and relative size, and indeed furnish one of the best and most reliable characters for distinguishing nearly allied species. This I believe also applies to the species of the genus *Cyclopina*. If therefore any peculiarity in the structure of these appendages is found, this ought in my opinion to be regarded as an infallible indication of specific difference, unless quite gradual transitions could be stated to occur. But, according to my recent investigations, such transitions do not in reality exist. I have already in Vol. VI recorded 2 species closely agreeing with *C. gracilis* in the structure of the several appendages, but easily recognisable by the different appearance of the caudal rami, and I now propose to distinguish 4 other species, 2 of which are likewise closely allied to that species, whereas the other 2 approach nearest to *C. longicornis*.

#### 80. *Cyclopina norvegica*, Boeck.

(Pl. LXIX, Fig. 1).

*Cyclopina norvegica*, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder.  
Chr. Vid. Selsk. Forhandl. 1864, p. 247.

Syn: *Cyclops salinus*, Brady.

*Specific Characters.*—*Female*. Body resembling in shape that of *C. gracilis*, but of rather inferior size, and having the anterior division more

regularly oval in form, with the cephalic segment less contracted in front. Tail comparatively slender, with the genital segment about as long as the 3 succeeding segments combined and very slightly dilated in its anterior part. Caudal rami much shorter than in *C. gracilis*, only slightly exceeding in length the anal segment, and scarcely more than 3 times as long as they are broad; seta of outer edge attached near the middle; innermost apical seta about twice as long as the outermost. Antennæ, oral parts, and natatory legs of a structure very similar to that in *C. gracilis*. Last pair of legs likewise built on the same type as in that species, though, on a closer comparison, exhibiting slight differences in their form, the distal joint being more elongate and more strongly constricted at the base, with the outer apical spine fully twice as long as the inner. Ovisacs of moderate size and closely appressed to the sides of the tail.

Colour uniformly whitish grey.

Length of adult female scarcely exceeding 0.50 mm.

*Remarks.*—The above described form is unquestionably that briefly announced by Boeck under the name of *C. norvegica* and also observed by several other authors, but regarded by them as identical with *C. gracilis* Claus. The latter species, originally described from the Mediterranean, has also been found by the present author on the Norwegian coast, and is figured in Vol. VI, Pl. IV.

*Occurrence.*—This is a pronouncedly littoral form, being only found close to the shores and frequently occurring in shallow pools left by the tide. I have met with it in many places, both of our southern and western coasts.

*Distribution.*—British Isles, bay of Kiel, coast of France, Polar Sea.

### 81. *Cyclopina brachystylis*, n. sp.

(Pl. LXX, Fig. 2).

*Specific Characters.*—*Female.* Body comparatively short and stout, with the anterior division broadly oval in form, greatest width occurring somewhat behind the middle. Tail comparatively less slender than in the preceding species, with the genital segment scarcely longer than the 2 succeeding ones combined. Caudal rami very short, not even attaining the length of the anal segment and only slightly longer than they are broad; seta of outer edge attached about in the middle; apical setæ of moderate length, the innermost one a little longer than the outermost. Anterior antennæ comparatively short and, as in the preceding species, only composed of 10 joints, the 6th of which is much the longest, though scarcely attaining the length of the 4 succeeding

joints combined. Last pair of legs resembling somewhat in shape those in the preceding species, but with the proximal joint comparatively less broad and the apical spines more unequal in length. Ovisacs very small and closely appressed to the sides of the tail.

Colour, as stated in a specimen recently taken at Sandefjord, pale yellowish grey with slight darker yellow shadows; anterior antennæ partly tinged with orange.

Length of adult female scarcely exceeding 0.56 mm.

*Remarks.*—By the very short caudal rami this form has a certain resemblance to *C. Schneideri* Scott (= *C. brevifurca* G. O. Sars), and may indeed on this account easily be confounded with that species. It is however much inferior in size, and moreover well distinguished by the structure of the anterior antennæ, which are comparatively shorter and, as in the preceding species, only composed of 10 joints, whereas these antennæ in *C. Schneideri* are distinctly 12-articulate. The general form of the body also is somewhat different in the two species.

*Occurrence.*—I have met with this form in several places, both on the southern and western coast of our country, and northwards at least to the Trondhjem Fjord (Bejan). It is found in moderate depths, from 10 to 50 fathoms, but never in the littoral zone.

## 82. *Cyclopina littoralis*, Brady.

(Pl. LXIX, fig. 3).

*Cyclopina littoralis*, Brady, Nat. Hist. Trans. Northumberland and Durham, Vol. IV, p. 429. Pl. XVII, figs 9–14.

*Specific Characters.*—*Female.* Body comparatively slender, resembling in shape that of *C. longicornis*, but rather inferior in size. Tail, including the caudal rami, about the length of the cephalic segment and slightly attenuated behind. Caudal rami much shorter than in *C. longicornis*, not nearly attaining the length of the 2 preceding segments combined, and scarcely more than 4 times as long as they are broad; seta of outer edge attached about in the middle; innermost apical seta more than twice as long as the outermost. Antennæ, oral parts, and natatory legs of a structure very similar to that in *C. longicornis*. Last pair of legs, as in that species, composed of 3 well defined joints, the middle one rather large, with the outer corner conically produced and tipped with a long seta; terminal joint comparatively small and

broadly rounded at the end, which carries 4 ciliated setæ, the innermost of which is the shortest. Ovisacs of moderate size and slightly divergent.

Body of a clear whitish colour and partly ornamented with a fine rosy pigment.<sup>1)</sup>

Length of adult female scarcely exceeding 0.65 mm.

*Remarks.*—It is possible that the form observed by Boeck more properly may be referable to the present species. In this case should consequently in strict law the form described in Vol. VI as *C. longicornis* Boeck have a new name. I think however it may be allowed to retain both these names in the sense here proposed. The 2 species are certainly very nearly allied, but may at once be distinguished by the different length of the caudal rami. I have failed to detect any transition in this respect.

*Occurrence.*—The species occurs along our whole southern and western coast, from the Christiania Fjord at least to Molde. It is always found close to the shores among algæ and sometimes, as stated by Brady, even in pools left by the tide, never, as is the case with *C. longicornis*, at any considerable depth.

*Distribution.*—British Isles (Brady), Mediterranean (Giesbrecht).

### 83. *Cyclopina dilatata*, n. sp.

(Pl. LXX, fig. 1).

*Specific Characters.*—*Female.* Body rather short and stout, with the anterior division unusually dilated and, viewed dorsally, of rounded oval form. Cephalic segment very large, about twice as long as the remaining part of the trunk, and quite evenly rounded in front. Tail comparatively narrow, and occupying nearly half the length of the body; genital segment about equalling in length the 2 succeeding segments combined and slightly widening in front. Caudal rami resembling in shape and relative length those in *C. littoralis*; seta of outer edge, however, attached somewhat in front of the middle. Anterior antennæ comparatively shorter and less attenuated than in the said species, but composed of 19 well defined joints clothed with comparatively short setæ. Posterior antennæ, oral parts, and natatory legs apparently of a structure similar to that in *C. littoralis*. Last pair of legs however, though built on the same type, of a somewhat different appearance, the terminal joint

<sup>1)</sup> The colour as signed (in Vol. VI) to *C. longicornis*, applies in reality only to the present species. *C. longicornis* is of a much paler hue.

being of rather larger size, fully as long as the other 2 combined, and obliquely rounded at the end. Ovisacs wanting in the specimens examined.

Colour of the living animal not yet ascertained.

Length of adult female 0.56 mm.

*Remarks.*—This form also is nearly allied to *C. longicornis*, but may at once be distinguished both from this and the other known species by the unusually broad and expanded anterior division of the body. The structure of the anterior antennæ and of the last pair of legs is also somewhat different.

*Occurrence.*—Two female specimens only of this form have as yet come under my notice. They were both found in a sample taken at Kors-havn from a depth of about 40 fathoms.

## Fam. Cyclopidæ.

### Gen. Euryte, Philippi.

#### 84. *Euryte minor*, Scott.

(Pl. LXX, fig. 2).

*Euryte longicauda*, var. *minor*, Scott, Twenty-third Annual Report of the Fishery Board for Scotland, Part III, p. 143, Pl. X, figs 13, 14.

*Specific Characters.*—*Female.* Very like *E. longicauda* Philippi, but rather inferior in size and of somewhat more slender form of the body. Anterior division, seen dorsally, rounded oval in outline, with the cephalic segment very large and broadly rounded in front. Rostrum strong and abruptly recurved. Tail including the last trunkal segment, occupying about half the length of the body; genital segment somewhat less broad than in *E. longicauda*, but, as in that species, armed on each side in the middle with a strong dentiform projection curving backwards; anal segment scarcely longer than the preceding one. Caudal rami resembling in shape those in *E. longicauda*, being rather narrow and elongated, diverging somewhat in their outer part. Antennæ oral parts, and legs of a structure very similar to that in the type species. Ovisacs narrow oblong in form, and somewhat less strongly divergent than in *E. longicauda*.

*Male* of smaller size than female and a little more slender of form, with the cephalic segment less broad in front and the tail composed of



5 well defined segments. Genital segment considerably dilated, almost quadrate in form, and, as a rule, containing on each side an oblong oval spermatophore. Caudal rami comparatively shorter than in female. Anterior antennæ very strongly hinged.

Colour whitish grey, with a very slight pale yellow tinge.

Length of adult female scarcely attaining 1 mm.; that of male 0.78 mm.

*Remarks.*—This form was considered by Scott and also by myself as only a variety of *E. longicauda*. I am however now of opinion that it should more properly be regarded as a separate, though closely allied species.

*Occurrence.*—I have met with this form in many different places of our coast, and have always found its characters constant. It is, unlike *E. longicauda*, a true deep-water form, occurring in depths ranging from 20 to 50 fathoms, never in the littoral zone.

*Distribution.*—Scottish coast (Scott).

## Siphonostoma.

### Fam. Ascomyzontidæ.

#### Gen. *Rhynchomyzon*, Giesbr.

#### 85. *Rhynchomyzon falco*, Giesbr.

(Pl. LXXI).

*Rhynchomyzon falco*, Giesbrecht, Die Asterocheriden des Golfes von Neapel, p. 102, Pl. 5, figs. 28—40.

*Specific Characters.*—*Male.* Body comparatively robuste, with the anterior division rather broad in the middle and somewhat depressed. Cephalic segment very large, about twice as long as the remaining part of the trunk, and, seen dorsally, triangular in outline, being gradually contracted anteriorly, with the extremity narrowly truncated; lateral corners slightly produced, bidentate. Rostrum very strong, falciform, and curved downwards. The 3 succeeding segments, like the cephalic segment, somewhat raised dorsally at the hind edge, and having the lateral corners produced to triangular recurved lappets. Last trunkal segment, as usual, much smaller than the preceding ones,



and slightly produced on each side. Tail comparatively short, not attaining half the length of the anterior division, and composed of 5 segments, the 1st (genital) of which is broadly quadrangular in form and provided at the hind corners with 2 juxtaposed setæ of unequal length; each of the 2 succeeding segments produced laterally to acute triangular lappets curved backwards; the last 2 segments firmly connected and without any lateral projections. Caudal rami comparatively short, being only slightly longer than they are broad, and somewhat divergent; apical setæ not much elongated. Anterior antennæ not nearly attaining the length of the cephalic segment, and scarcely at all hinged, being composed of 17 joints, the 1st of which is much the largest, the 9th imperfectly subdivided in the middle; proximal half of the antenna somewhat thickened and clothed in front with scattered rather strong spiniform setæ, carrying moreover 8 very slender recurved æsthetascs; penultimate joint with a single such æsthetasc behind near the end. Posterior antennæ resembling in structure those in the 2 other known species. Oral cone, as in *R. purpurotinctum*, very massive and prominent, but not prolonged in any true siphonal tube. Mandibles rather strong, pronouncedly cultriform, and finely denticulated inside the extremity; palp very small. Maxillæ, maxillipeds and natatory legs of the usual structure. Last pair of legs extremely small, biarticulate.

Colour of the living animal not yet ascertained.

Length of the specimen examined 1.25 mm.

*Remarks.*—I think I am right in determining the above-described remarkable form as the hitherto unknown male of *R. falco* Giesbrecht. It may easily be recognised from the other 2 Norwegian species described in Vol. VI by the robust form of the body, by the strongly marked armature of the segments, and by the comparatively short caudal rami.

*Occurrence.*—The solitary specimen obtained was found in a sample taken at Risør from a depth of about 30 fathoms.

*Distribution.*—Gulf of Naples (Giesbrecht).

## Fam. Acontiphoridae.

## Gen. Acontiphorus, Brady.

86. *Acontiphorus ornatus*, Brady.

(Pl. LXXII).

*Ascomyzon ornatum*. Brady & Robertson, British Assoc. Report p. 197.

*Specific Characters.*—*Female.* Body on the whole of a more robust appearance than in *A. scutatus*, with the anterior division broadly oval in form and somewhat depressed, greatest width considerably exceeding half the length and occurring behind the middle. Cephalic segment very large, nearly twice the length of the trunk, and narrowly rounded in front, lateral corners slightly produced. The 3 succeeding segments comparatively broad, with the epimeral plates somewhat expanded and distinctly angular behind. Last trunkal segment very small. Tail slightly exceeding in length  $\frac{1}{3}$  of the anterior division; genital segment about occupying half the length of the tail and almost of equal width throughout, lateral corners of this and the succeeding segment acutely produced behind. Caudal rami comparatively short, being scarcely longer than they are broad; apical setae well developed and partly finely plumose. Anterior antennae much more slender and elongated than in *A. scutatus*, and composed of 16 well defined joints, the 3rd of which is much the largest; proximal part of the antenna only slightly dilated and clothed with strong partly ciliated setae. Posterior antennae likewise comparatively more slender than in the type species, though of rather similar structure. Siphonal tube scarcely extending beyond the anterior division of the body. Oral appendages and natatory legs on the whole built on the same type as in *A. scutatus*. Last pair of legs, however, of comparatively larger size, with the proximal joint very broad, lamellar, and irregularly indented behind; distal joint oval in form and provided with 5 ciliated setae of about equal length.

Colour of the living animal not yet ascertained.

Length of adult female 1.03 mm.

*Remarks.*—This form was at first recorded by Brady and Robertson under the name of *Ascomyzon ornatus*, and was subsequently redescribed and figured by the first-named author in his well-known Monograph as *Acontiphorus armatus*. As however the specific name *ornatus* is the older one; it must be retained for the present form. The differences between this species and *A. scutatus* are very pronounced, and at first I therefore believed them to

be of generic value. I am however now disposed to include both species in the same genus.

*Occurrence.*—A solitary female specimen only of this pretty form has as yet come under my notice. It was found in a sample taken at Risør in about the same place, where *Rhyncomyzon falco* occurred.

*Distribution.*—British Isles (Brady), Mediterranean (Giesbrecht).

## Poecilostoma.

### Fam. Lichomolgidæ.

Gen. **Hermannella**, Canu.

87. **Hermannella dubia**, n. sp.

(Pl. LXXIII, fig. 1).

*Specific Characters.*—*Male.* Anterior division of body rather broad, sub-depressed, seen dorsally broadly oval in outline, with the greatest width equalling  $\frac{2}{3}$  of the length and occurring in front of the middle. Cephalic segment very large, fully twice as long as the 3 succeeding segments combined, and evenly rounded in front, exhibiting behind the middle a well-marked transverse suture. Last trunkal segment very small. Tail about equalling in length  $\frac{2}{3}$  of the anterior division, and composed of 5 well defined segments, the 1st of which (the genital segment) is very large and expanded, almost circular in outline, exhibiting on each side a roomy chamber for the reception of the spermatophores; the remaining segments narrow cylindrical in form, the last being the largest. Caudal rami about 3 times as long as they are broad and scarcely at all divergent; seta of outer edge attached in the middle; apical setæ partly broken in the specimen examined, but apparently normal. Anterior antennæ less slender than in the other known species, scarcely exceeding half the length of the cephalic segment, and only composed of 6 joints. Posterior antennæ not very strong, and composed of 4 well-defined joints, the 2nd of which is the largest; 3rd joint armed at the end anteriorly with a hook-like spine accompanied proximally by 2 small bristles; last joint of about same size and provided at the tip with 4 curved claws, 2 of which

are distinctly jointed in the middle; outside the latter a slender curved seta is attached. Maxillæ with the masticatory lappet fusiform in shape and exerted to a very long and narrow setiform lash, inner edge armed with about 8 strong curved denticles, outer edge ciliated; palp of the usual appearance. Anterior maxillipeds with the distal joint gradually tapered and provided inside with a stout spine, terminal process only slightly curved and armed outside with 4—5 unusually slender spinules. Posterior maxillipeds exhibiting the structure usual for male specimens. The 3 anterior pairs of natatory legs on the whole of normal appearance, with the rami comparatively broad and subequal in size; 4th pair however distinguished by the want of the outer-edge spines on the outer ramus, inner ramus scarcely narrower than the outer and having 2 setæ inside the middle joint, terminal joint with 3 unusually slender spines at the end and with the inner edge smooth. Last pair of legs with the free joint narrow linear in form and carrying at the tip a slender spine and a somewhat shorter seta, inner distal corner produced to a well-marked dentiform projection.

Colour of the living animal not yet ascertained.

Length of the specimen examined 0.70 mm.

*Remarks.*—The above-described form cannot be referred to any of the hitherto known species, differing, as it does, conspicuously by the comparatively short 6-articulate anterior antennæ, as also by the structure of the posterior antennæ and that of the 4th pair of legs. In the broadly expanded anterior division of the body it somewhat resembles *H. valida* G. O. Sars, but is otherwise very different from that species.

*Occurrence.*—The solitary male specimen obtained was found in a sample taken by Mr. Kjær at Drøbak from a depth of about 50 fathoms.

### Gen. *Lichomolgella*, G. O. Sars.

#### 88. *Lichomolgella pusilla*, G. O. Sars.

(Pl. LXXIII, fig. 2).

See: Vol. VI, p. 216, Pl. CXVIII, fig. 1.

*Remarks.*—This dwarfed form has been described and figured in Vol. VI from a solitary specimen taken at Skutesnæs, S. W. coast of Norway. On the accompanying plate I give new habitus-figures with some details of another specimen obtained on the south coast, at Lillesand. As seen from the figure, the lateral view of the body is rather characteristic by the unusually deep

and boldly vaulted cephalic segment giving the animal in that situation a very extraneous appearance. The specimen, though fully adult, did not exceed a length of 0.40 mm.

Gen. **Pseudomolgus**, G. O. Sars.

89. **Pseudomolgus arenicola**, Brady.

(Pl. LXXIV).

*Lichomolgus arenicolus*. Brady, Monogr. of British Copepoda, Part III, p. 46, Pl. LXXXVIII, figs 1-7.

*Specific Characters.*—*Female.* General form of body very like that in *P. leptostylis* G. O. Sars<sup>1)</sup>, though perhaps a little less slender, with the anterior division more regularly oval in outline, the greatest width occurring in the middle. Head very distinctly defined from the 1st trunkal segment and narrowly truncated at the extremity. Last trunkal segment remarkably narrow and elongated. Tail about equalling in length the head and 1st trunkal segment combined; genital segment fusiform in shape and distinctly subdivided in the middle by a transverse dorsal suture; anal segment only slightly longer than the preceding segment. Caudal rami much shorter than in *P. leptostylis*, not nearly attaining the length of the 2 preceding segments combined, and about of equal width throughout. Anterior antennæ rather slender and, as in the 2 other species, composed of 7 joints, the somewhat oblique suture between the last 2 joint being distinctly marked. Posterior antennæ very powerful, and agreeing both in form and armature with those in *P. leptostylis*. Anterior lip deeply insinuated in the middle. Maxillæ with the 2 proximal denticles of the principal masticatory lappet somewhat lamellar in shape, their inner sharpened edge being divided into 3 or 4 fine spinules; palp of a somewhat irregular form, and having in the middle of the rounded extremity a well-marked narrow incision. Maxillipeds and legs almost exactly as in *P. leptostylis*.

Body semipellucid, of a uniform whitish grey colour, with darker translucent ovaria. Eye well observable, with light reddish pigment.

Length of the specimen examined 1.60 mm.

*Remarks.*—I cannot doubt that the above-described form is identical with the British species recorded by Brady and by Scott, though the description and figures given by those authors do not fully agree with those here given. The species is indeed still more closely allied to *P. leptostylis* than I had

<sup>1)</sup> See Vol. VI, p. 182, Pl. CIII.



formerly supposed by consulting the statements given by the said authors. Yet the species may at once be distinguished both from this and the other species (*P. dilatatus*) by the much shorter and stouter caudal rami.

*Occurrence.*—A solitary fully adult female specimen of this form was taken last summer at Hvalør, outside the Christiania Fjord, from a depth of about 10 fathoms.

*Distribution.*—British Isles (Brady, Scott).

## Fam. Sapphirinidæ.

### Gen. *Sapphirina*, Thompson, 1829.

*Generic Characters.*—Body more or less conspicuously depressed and rather unlike in the two sexes, that of male much broader than in female and blade-like, with the epimeral plates of both the anterior and posterior divisions lamellarly expanded, exhibiting moreover, in the living animal, a beautiful iridescent or opaline lustre. Head generally well defined from the 1st trunkal segment, and provided in front with 2 closely set cuticular lenses (conspicilla), behind which, as in *Corycæus*, at some distance 2 rod-like, pigmented strings occur, each terminating in a highly refractive body.<sup>1)</sup> Tail much narrower in female than in male, and in both sexes composed of 5 well defined segments. Caudal rami blade-like, with the marginal setæ very small. Anterior antennæ alike in the two sexes, and rather short, with the number of joints somewhat reduced. Posterior antennæ distinctly prehensile, terminating in a short and stout claw. Oral parts built on the very same type as in the *Lichomolgidæ*. Natatory legs well developed and more or less incurved, with both rami 3-articulate. Last pair of legs very small, uniarticulate, extended laterally.

*Remarks.*—This genus was established by I. V. Thompson as early as the year 1829, when our knowledge of the marine Copepoda was still very imperfect. The species observed by that zoologist (*S. indicator*) cannot be identified; but it is evident that he has had before him male specimens of some species belonging to the present genus, the brilliant iridescence of their bodies having at once attracted his attention.—The genus comprises numerous

<sup>1)</sup> As to the significance of this apparatus, I may refer to the note given in Vol. VI, p. 195,

species, chiefly occurring in the equatorial parts of the Oceans, though sometimes by currents thrown more or less out of their true home. They are all pronouncedly pelagic animals, being as a rule met with in the open sea, near the surface of the water. As is the case with the other poecilostomous Cyclopoida, they are semiparasitic in habits, the females being at times found within the pallial cavity of various pelagic *Tunicata* (*Salpæ*, *Pyrosoma* etc.). More generally however they are taken free in the sea, and this is always the case with the males.

#### 90. *Sapphirina iris*, Dana.

(Pl. LXXV & LXXVI).

*Sapphirina iris*, Dana, United States Explor. Expedition, Crustacea, p. 1239, Pl. 87, figs. 1 a - d

Syn: *Sapphirina salpæ*, Claus.

" *gemma*. Brady (not Dana).

*Specific Characters.*—*Female*. Body elongate, gradually tapered behind, with all the segments sharply marked off from each other. Head defined from the 1st trunkal segment by a distinct, somewhat flexuous suture, and obtusely rounded in front; conspilla well marked and closely approximate. Epimeral plates of the 3 middle trunkal segments distinctly prominent and obtuse-angular behind. Last trunkal segment much smaller than the preceding ones, but well defined. Tail rather narrow, exceeding somewhat half the length of the anterior division, and composed of 5 sharply defined segments, the genital segment being distinctly subdivided in the middle; lateral corners of this and the 3 succeeding segments angular behind; anal segment exceeding in size the preceding segment and quadrangular in form. Caudal rami rather large, attaining the length of the 2 preceding segments combined, and oblong oval in outline, with the inner edge much more curved than the outer and slightly angular at the end; seta of outer edge attached about in the middle, dorsal seta placed much nearer the extremity. Anterior antennæ comparatively short and stout, gradually tapered distally, being composed of 5 joints, the 2nd of which is much the largest, occupying about half the length of the antenna. Posterior antennæ rather strong, with the terminal part (composed of the last 2 joints) much shorter than the preceding joint; apical claw short and stout, accompanied in front by 2 small bristles. Natatory legs with both rami well developed and of nearly equal size. Last pair of legs represented on each side by a small conical joint tipped with 2 unequal bristles. Ovisacs very long and narrow, almost cylindrical in shape, and containing numerous ova.



*Male* rather unlike the female in its outward appearance, the body being very thin, blad-like, and broadly oval in outline, with the epimeral plates of all the segments, except the last trunkal and the last caudal one, lamellarly expanded and closely contiguous. Last trunkal segment very small and almost wholly concealed by the neighboring segments. Last caudal segment likewise much smaller than in female. Conspicilla less sharply marked, and somewhat remote from the frontal margin. Posterior maxillipeds, as usual, more fully developed than in female, with the apical claw long and slender.

Body of female (according to Giesbrecht) of a somewhat opaque yellowish grey colour, with pale reddish ovaria and ovisacs; that of male highly pellucid and, in the living state, brilliantly iridescent.

Length of female attaining 7.40 mm.; that of male 7.10 mm.

*Remarks.*—This is much the largest of the known species, and in the adult state it may thereby be easily recognised. In the general form of the body, however, as also in the structure of the several appendages it agrees very nearly with some of the other species, for instance *S. genma* Dana, with which it was indeed identified by Brady. The *S. salpæ* of Claus is quite certainly the present species.

*Occurrence.*—The present form, it is true, has not yet been recorded from the Norwegian coast, nor have I myself ever met with it here. I think, however, that it notwithstanding ought to be included in the Norwegian fauna as an occasional visitor. For it not seldom happens that shoals of *Salpæ* (*S. runcinata*, Chamisso) by heavy gales and currents are thrown from the open sea to certain points of our western coast, and, as the present copepod is a constant companion of *Salpæ*, it is very likely to believe that it also in such cases has been associated with these pelagic Tunicata<sup>1)</sup>. The figures here given are drawn from specimens taken during the Monaco Expeditions in the North Atlantic Ocean.

*Distribution.*—North and South Atlantic, Mediterranean, Indian Ocean, Pacific.

<sup>1)</sup>, My late father once witnessed such an influx of *Salpæ* at Florø, where he at that time was settled as a pastor, and on a drawing made by him of a *Salpæ* a parasite was indeed sketched within the pallial cavity, the relatively large size of this parasite supporting the suggestion that in fact it might have been a female of the present species of *Sapphirina*.



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*Sapphirina iris*, Dana ♀.

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1. The first part of the document is a list of names and addresses. The names are written in a cursive hand, and the addresses are in a more formal, printed style. The list appears to be a directory or a list of correspondents.

2. The second part of the document contains several paragraphs of text. The text is written in a cursive hand and appears to be a letter or a report. The content is mostly illegible due to the fading of the ink.

3. The third part of the document contains a list of names and addresses, similar to the first part. The names are written in a cursive hand, and the addresses are in a more formal, printed style.

4. The fourth part of the document contains several paragraphs of text, similar to the second part. The text is written in a cursive hand and appears to be a letter or a report.

5. The fifth part of the document contains a list of names and addresses, similar to the first and third parts. The names are written in a cursive hand, and the addresses are in a more formal, printed style.

6. The sixth part of the document contains several paragraphs of text, similar to the second and fourth parts. The text is written in a cursive hand and appears to be a letter or a report.

7. The seventh part of the document contains a list of names and addresses, similar to the first, third, and fifth parts. The names are written in a cursive hand, and the addresses are in a more formal, printed style.

8. The eighth part of the document contains several paragraphs of text, similar to the second, fourth, and sixth parts. The text is written in a cursive hand and appears to be a letter or a report.

9. The ninth part of the document contains a list of names and addresses, similar to the first, third, fifth, and seventh parts. The names are written in a cursive hand, and the addresses are in a more formal, printed style.

10. The tenth part of the document contains several paragraphs of text, similar to the second, fourth, sixth, and eighth parts. The text is written in a cursive hand and appears to be a letter or a report.

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2. The second part of the document contains several paragraphs of text. The text is written in a cursive hand and appears to be a letter or a report. The content is mostly illegible due to the fading of the ink.

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10. The tenth part of the document contains several paragraphs of text, similar to the second, fourth, sixth, and eighth parts. The text is written in a cursive hand and appears to be a letter or a report.



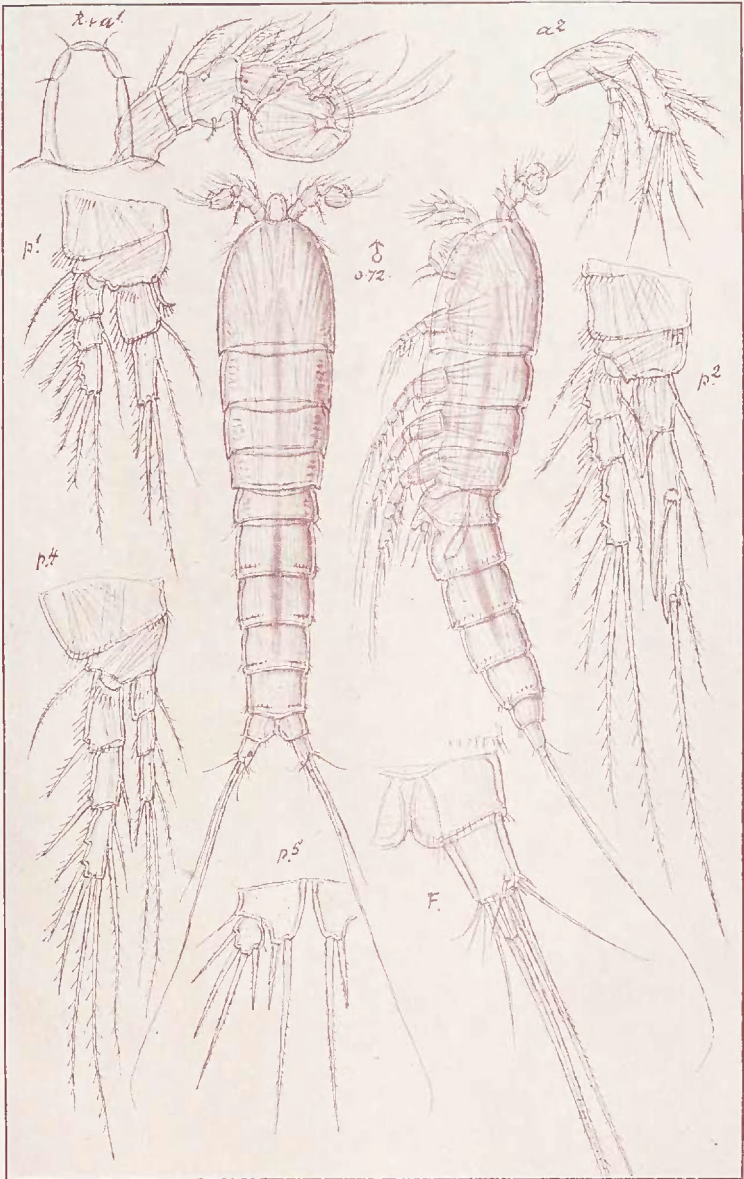


# Copepoda

Suppl. Volume

Tachidiidæ

Pl. LXV



G. O. Sars, del.

*Psammis longisetosa*, G. O. Sars  
(male)



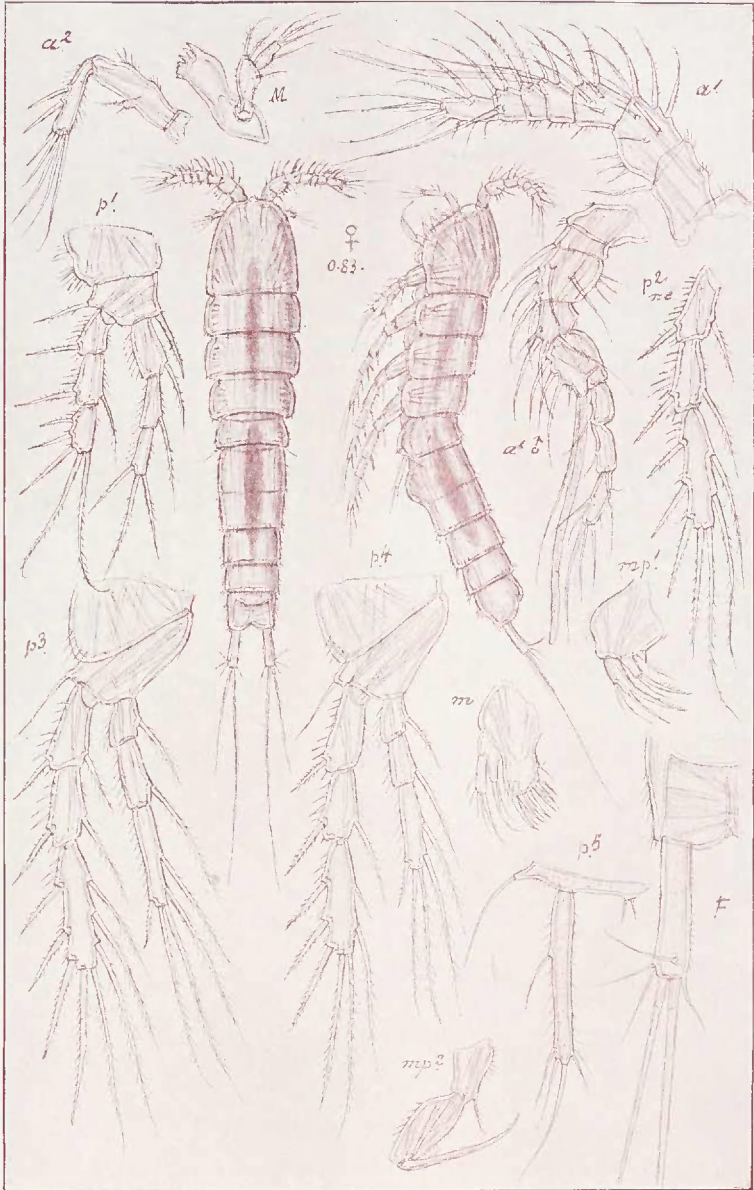


# Copepoda

Tachidiidæ

Suppl. Volume

Pl. LXVI



G. O. Sars, del.

*Argestes tenuis*, G. O. Sars

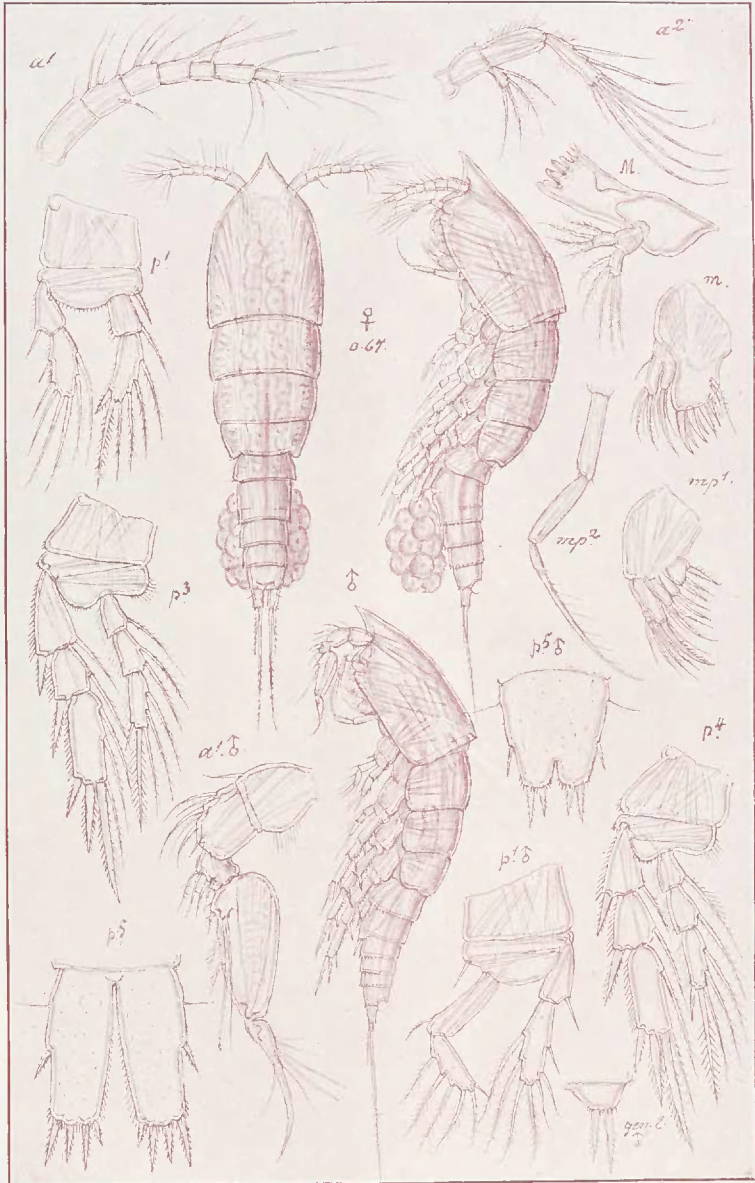


# Copepoda

Suppl. Volume

Tachidiidæ

Pl. LXVII



G. O. Sars, del.

*Euterpina acutifrons*, (Dana)







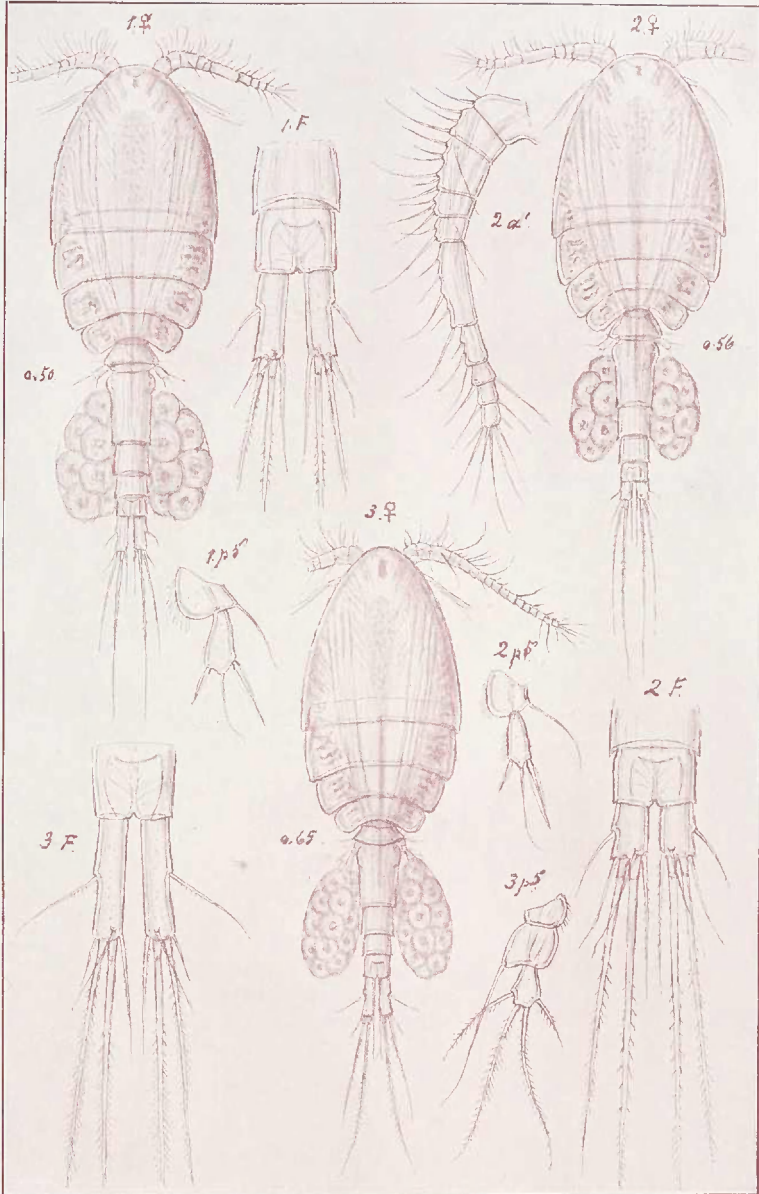


# Copepoda

Cyclopinidæ

Suppl. Volume

Pl. LXIX



G. O. Sars. del.

1. *Cyclopina norvegica*, Boeck.
2. — *brachystylis*, G. O. Sars.
3. — *litoralis*, Brady.

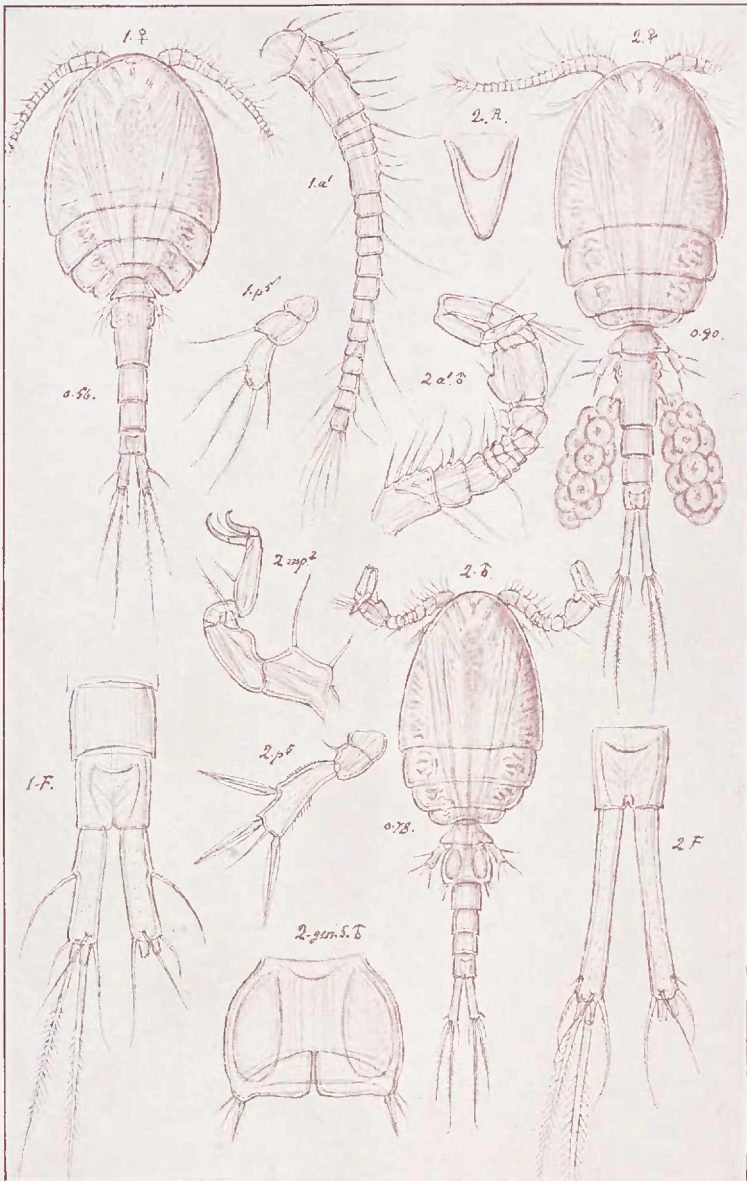


# Copepoda

Cyclopinidæ Cyclopidæ

Suppl. Volume

Pl. LXX



G. O. Sars. del.

1. *Cyclopina dilatata*, G. O. Sars.
2. *Euryte minor*, Scott.







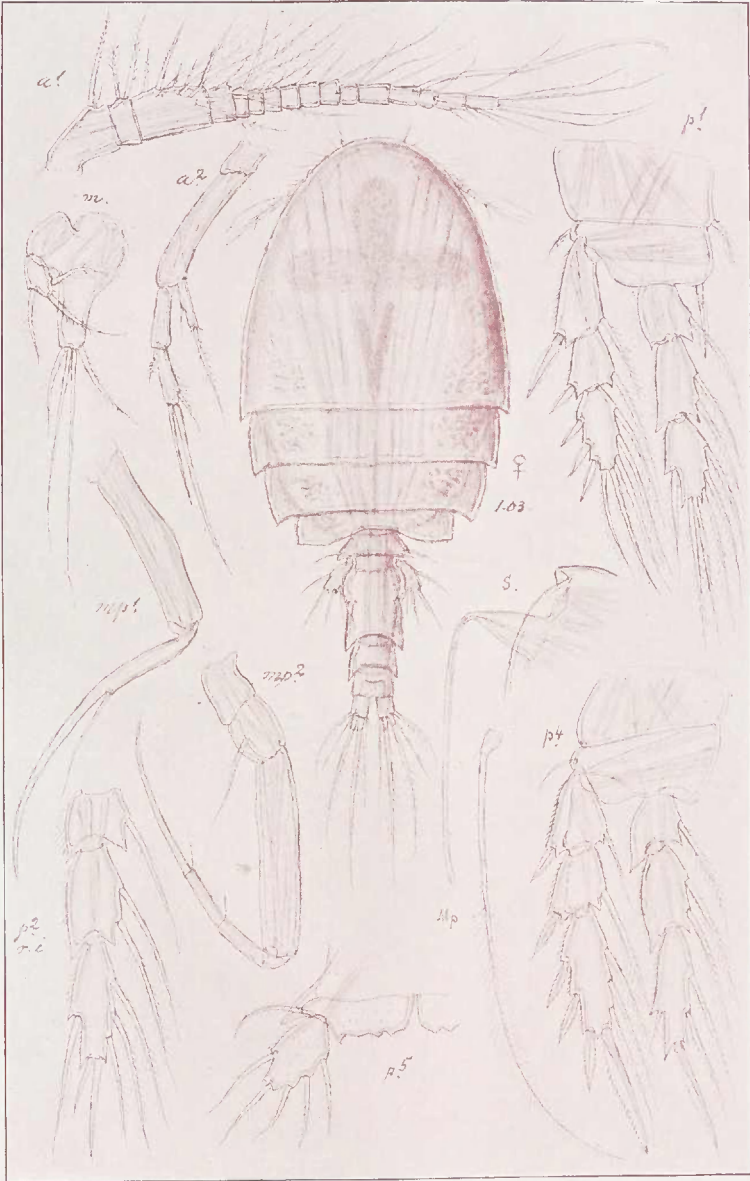


# Copepoda

Suppl. Volume

Acontiophoridae

Pl. LXXII



G. O. Sars, del.

*Acontiophorus ornatus*, Brady

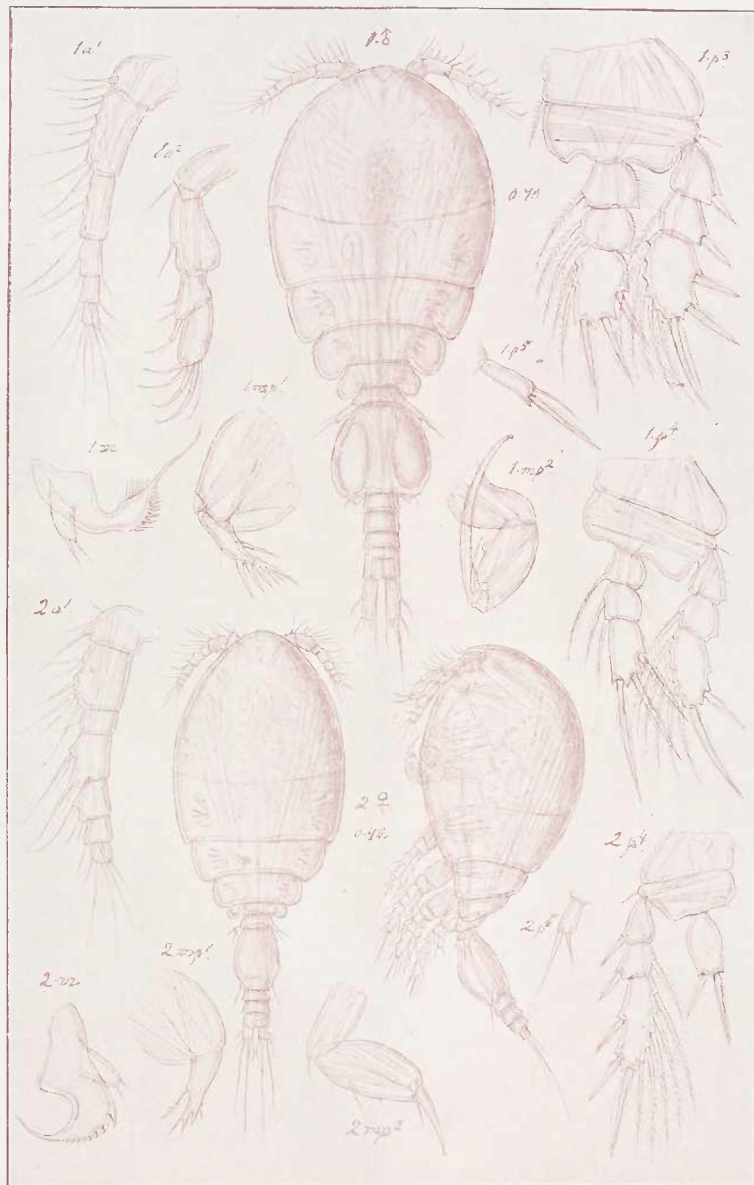


# Copepoda

Suppl. Volume

Lichomolgidae

Pl. LXXIII



G. O. Sars, del.

1. *Hermanella dubia*, G. O. Sars.
2. *Lichomolgella pusilla*, G. O. Sars.

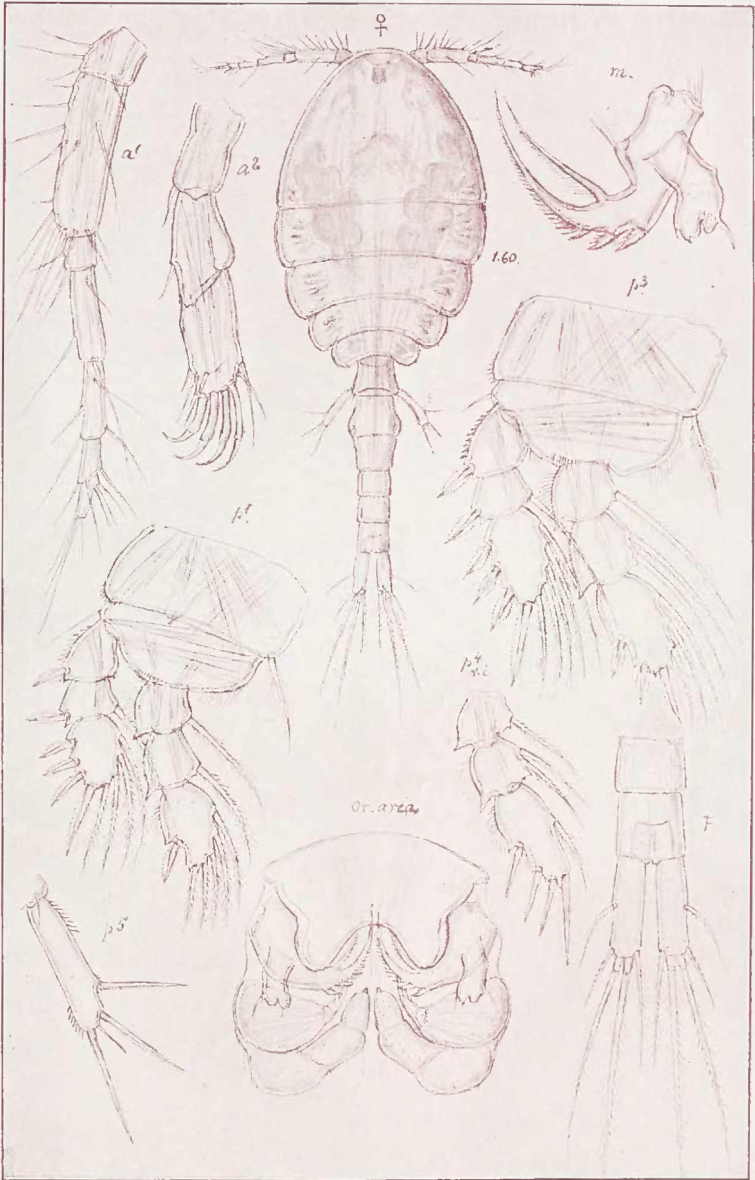


# Copepoda

Lichomolgidae

Suppl. Volume

Pl. LXXIV



G. O. Sars, del.

*Pseudomolgus arenicola*. (Brady).

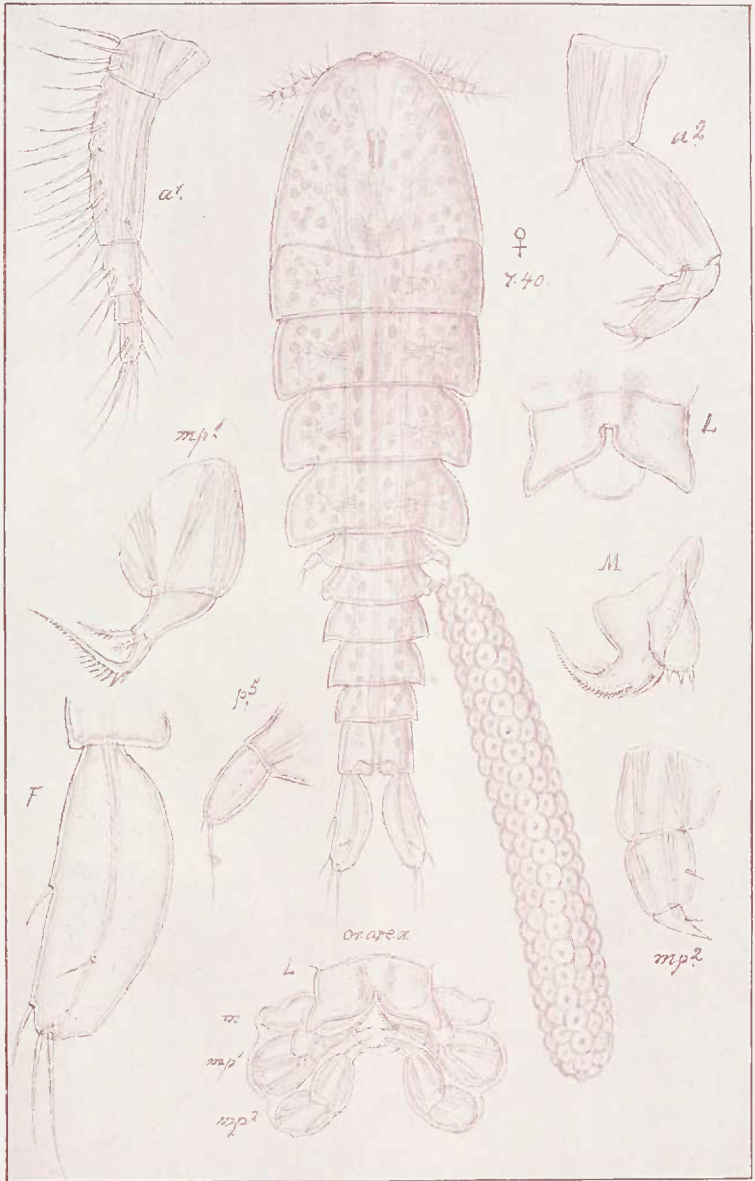


# Copepoda

Sapphirinidæ

Suppl. Volume

Pl. LXXV



G. O. Sars, de .

*Sapphirina iris*, Dana ♀



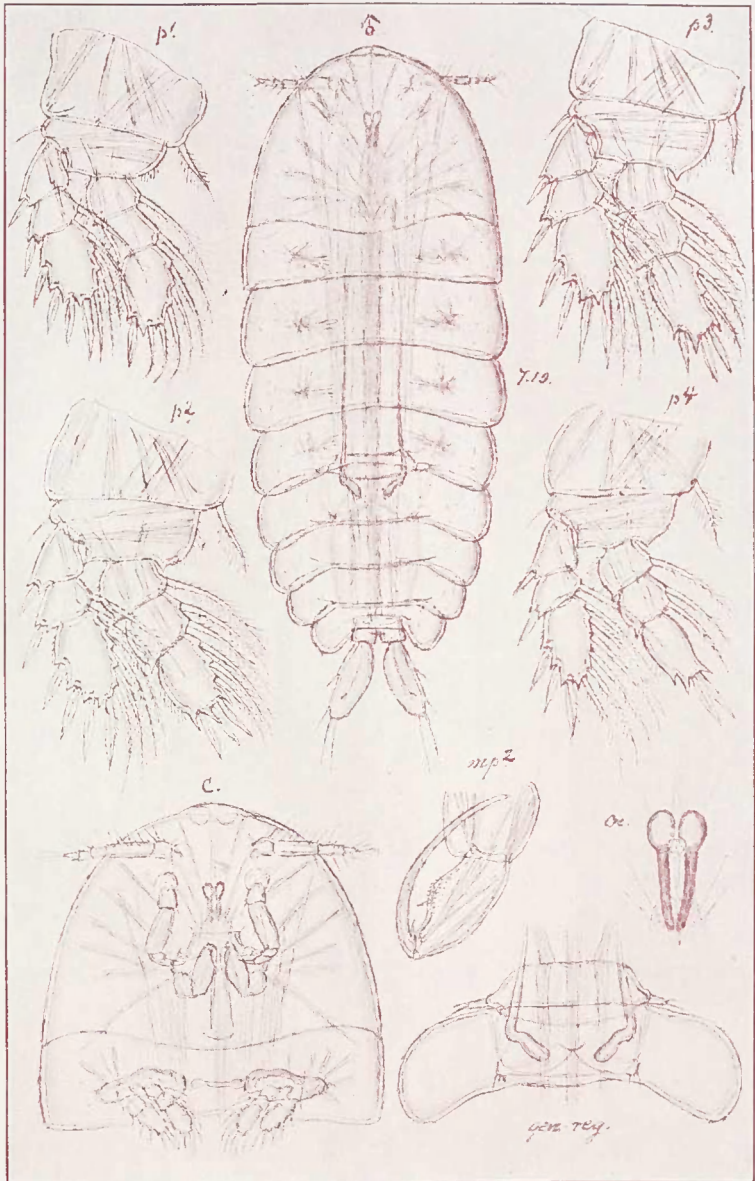


# Copepoda

Sapphirinidæ

Suppl. Volume

Pl. LXXVI



G. O. Sars, del.

*Sapphirina iris*, Dana ♂

